

DESCRIPTION OF *SCATELLA SAVEGRE*, A NEW SPECIES FROM
COSTA RICA IN THE *TRISETA* GROUP (DIPTERA: EPHYDRIDAE)

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Abstract.—A new species of *Scatella* belonging to the *trisetata* group, *S. savegre*, is described from specimens collected in Costa Rica (San José: Río Savegre, San Gerardo de Dota (9°39.5'N, 83°51'W; 2,180 m)). For perspective, diagnoses for *Scatella* and the *trisetata* group are provided, and to facilitate identification a key to species of the *trisetata* group as well as figures of the head and wings (male and female) are provided.

Key Words: *Scatella*, the *trisetata* group, Ephydriidae, shore flies, Costa Rica

Scatella Robineau-Desvoidy is among the most speciose genera of shore flies with 135 species in six subgenera worldwide (Mathis and Zatwarnicki 1995). Of the six subgenera, the nominate subgenus, *Scatella*, comprises most of the diversity with 76 species that collectively occur essentially worldwide in temperate and tropical zones. Within the subgenus *Scatella*, the *trisetata* group has been recognized (Mathis and Shewell 1978) for three New World species (*S. trisetata* Coquillett, *S. marinensis* (Cresson), *S. melanderi* (Cresson)) that: (1) form a monophyletic group, (2) are easily distinguished as a group from congeners, and (3) occur in the western United States (British Columbia south to Baja California Norte). While conducting field work in Costa Rica, we discovered a fourth species, which is the subject of this paper. This fourth species substantially extends the range of the *trisetata* group and represents another connection between the shore-fly faunas occurring in montane habitats of Central America and western North America (Clausen 1987).

MATERIALS AND METHODS

The descriptive terminology, with the exceptions noted in Mathis (1986) and Mathis and Zatwarnicki (1990), follows that published in the *Manual of Nearctic Diptera* (McAlpine 1981). Because specimens of the new species are small, less than 3.5 mm in length, study and illustration of the male terminalia required use of a compound microscope. The species' description is composite and not based solely on the holotype. One head and two venational ratios that are used in the descriptions are defined below (all ratios are based on three specimens: the largest, smallest, and one other). Gena-to-eye ratio is the genal height measured at the maximum eye height/eye height. Costal vein ratio is the straight-line distance between the apices of R_{2+3} and R_{4+5} /distance between the apices of R_1 and R_{2+3} . M vein ratio is the straight-line distance along vein M between crossveins dm-cu and r-m/distance apicad of dm-cu.

Although most specimens are in the National Museum of Natural History, Smith-

sonian Institution, Washington, DC (USNM), we also borrowed and studied numerous specimens from the Instituto Nacional de Biodiversidad (INBio), Santo Domingo, Heredia, Costa Rica.

Genus *Scatella* Robineau-Desvoidy

Scatella Robineau-Desvoidy 1830: 801.

Type species: *Scatella buccata* Robineau-Desvoidy, 1830 (= *Ephydra stagnalis* Fallén, 1813), subsequent designation of Coquillett 1910: 603.—Wirth 1965: 757 [Nearctic catalog]; 1968: 24–26 [Neotropical catalog].—Mathis and Zatwarnicki 1995: 262–281 [world catalog].

Diagnosis.—*Scatella* is distinguished from other genera of the tribe Scatellini by the following combination of characters: minute to small shore flies, body length 0.8–3.5 mm, 2 laterocline fronto-orbital setae; face protrudent with an interfoveal dorsal hump; mesonotum generally unicolorous or with inconspicuous longitudinal stripes; wings lightly to darkly infuscate or gray with white spots; costa long, extended to vein M; gonial arch divided ventrally, in most cases separated into 3 parts: 2 lateral gonites and a ventral bandlike neohypandrium may be reduced.

Description.—*Head*: Frons dull, usually with distinct subshiny to shiny mesofrons; laterocline fronto-orbital setae 2. Antenna short, dark; pedicel with strong seta ventrally; 1st flagellomere round; arista macropubescent to at most bearing short, hairlike, dorsal branches. Face conspicuously protruding, with an interfoveal dorsal hump, uniformly sclerotized, lacking processes; facial setae conspicuous, usually 1–2 porrect to slightly dorsocline setae, 4–8 ventrocline setae along oral margin. Eye nearly round. Gena short to moderately high, usually bearing a large seta; palpus elongate, mostly dark, occasionally yellow.

Thorax: Mesonotum generally dark colored, microtomentose, density of microtomentum varying, generally unicolorous or with inconspicuous longitudinal stripes

with pattern of bands and/or spots; dorso-central setae usually 2 (0+2), sometimes 3 (1+2, subgenus *Neoscatella*); scutellum flat, disc bare, bearing 2 pairs of marginal setae; pleural region generally gray, lighter than mesonotum; legs typical, usually without distinct setae (ventral row of spinulae on midtibiae of males of some species); color of tarsi variable; stem of halter short, knob oval, white. Wing generally with pale to conspicuous white spots, especially in cells R_{2+3} , R_{4+5} , and discal cell but only occasionally in cell R_1 ; costa long, extended to vein M; wing rarely brachypterous.

Abdomen: Tergites gray to brown, microtomentose, sometimes with lighter posterior margins, or mostly shiny, blackish brown. Male terminalia as follows: epandrium a closed plate, narrowed ventrally; cerci completely round, rarely separated anteriorly; gonites elongate, sharply terminated, sometimes bearing setae on dorsal margin of anterior portion; neohypandrium as a more or less sinuous band; phallapodeme reduced; ejaculatory apodeme large, band-like, broad at marginal connection to dorsal aedeagal opening; aedeagus shoe-shaped in lateral view (broader and roundedly angulate basally, tapered to apex), in most species bearing narrow, single or paired sinuous ventral process that originates from ventral side of distal aedeagal margin.

Discussion.—There are six subgenera in *Scatella*, and the *triseta* group is in the nominate subgenus *Scatella*, which is distinguished from other subgenera by the following combination of characters: setae of pedicel, if present, short, not more than $\frac{1}{2}$ length of arista; dorsocentral setae 2, both postsutural (0+2); 1 prominent, presutural acrostichal seta; postsutural supra-alar seta reduced, $\frac{1}{2}$ length of postalar seta; scutellar disc bare; wing generally infuscate with evident pattern of white spots; setae of mid-coxa short; male midfemur lacking row of setae; pulvilli evident, normally developed, tarsal claws normally developed, not conspicuously elongate.

The Neotropical fauna of the subgenus



Figs. 1–2. *Scatella savegre* (COSTA RICA, San José: Río Savegre (9°35'N, 83°48'W; 2,450 m). 1, Head, anterior view. 2, Same, lateral view.

Scatella comprises 35 species (Mathis and Zatwarnicki 1995), and of these, six occur in Mesoamerica. Most of the known Neotropical species occur in Argentina and Chile, including the Juan Fernández Islands, where there is considerable endemicity.

The *trisetata* group

Diagnosis.—Species of the *trisetata* group are distinguished by the following combination of characters: usually larger than other *Scatella*, body length 2.20–4.00 mm.

Description.—*Head:* Ocelli arranged in an equilateral triangle; dorsalmost postocular setae weakly developed, subequal to pseudopostocellar setae; arista longer than combined length of scape, pedicel, and 1st flagellomere, micropectinate dorsally; facial setae extended from interfoveal hump to posteroventral corner of face, well developed, subequal to length of setae along oral margin, often semiporrect.

Thorax: Acrostichal setae small, hair-like, lacking distinctly larger pair at transverse suture; dorsocentral setae 3 (1+2); supra-alar seta rudimentary, at most ½ length of postalar seta; scutellum with 2 lateral se-

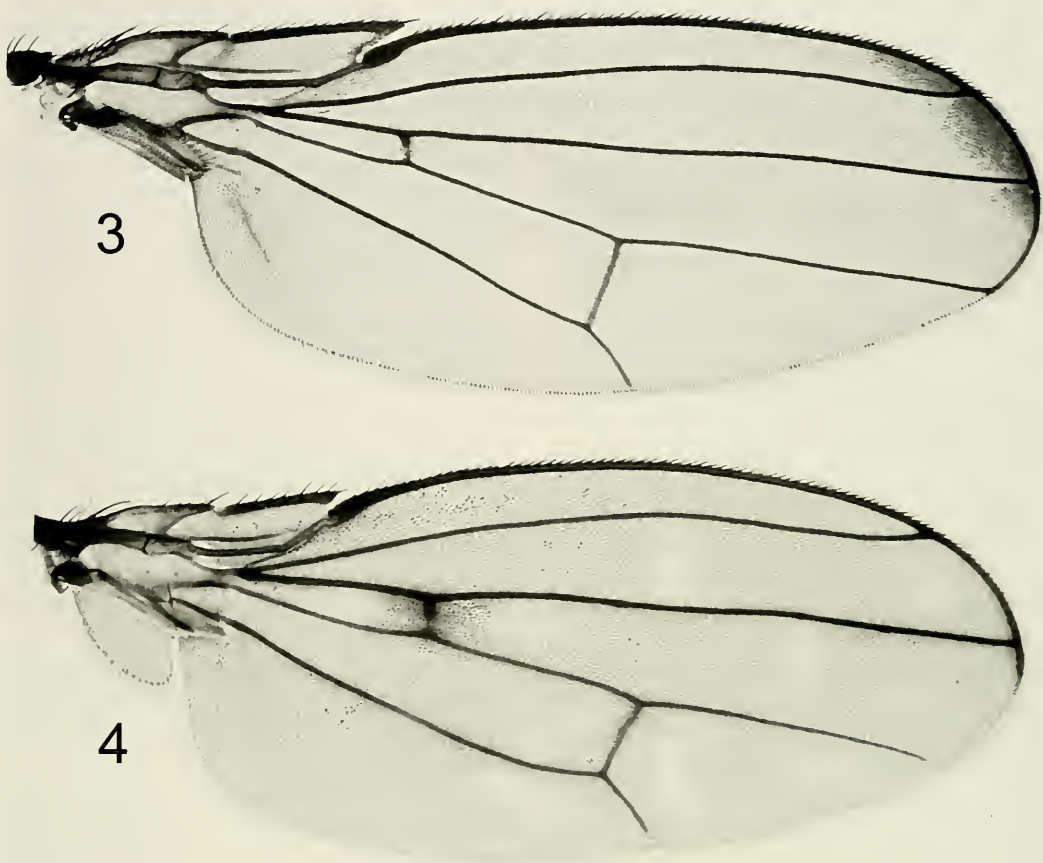
tae; costal margin with interspersed, slightly larger setulae, length of these not more than width of costal vein.

Abdomen: Phallapodeme flattened dorsoventrally; surstylus fused indistinguishably with venter of epandrium.

Remarks.—Mathis and Shewell (1978) first recognized and characterized the *trisetata* group, which then included three Nearctic species that occur in the western United States and Canada. He also documented the species group's monophyly, which is based on two synapomorphies (their numbers 24 and 25).

KEY TO SPECIES OF THE *TRISETATA* GROUP OF *SCATELLA*

1. Face uniformly dark brown; wing spots conspicuous, well developed (west coast of North America) *S. melanderi* (Cresson)
- Face bicolored, dorsum of interfoveal hump brown, contrasted with grayer ventral portion; wing mostly hyaline to very lightly infuscate, white spots weakly to moderately evident 2
2. Wing spots not evident, male wing completely hyaline except for an apical, narrow brown spot at apex of veins R_{2+3} and R_{4+5} (Costa Rica) *S. savegre*, new species



Figs. 3–4. *Scatella savegre* (COSTA RICA. San José: Río Savegre (9°35'N, 83°48'W; 2,450 m). 3, Wing of male, dorsal view. 4, Wing of female, dorsal view.

- Wing spots moderately evident, lacking apical brown spot 3
- 3. Mesonotum and scutellum dull, microtomentose, brown with some weak golden microtomentum; dorsum of scutellum flat (western United States and Canada) *S. trisetata* Coquillett
- Mesonotum and scutellum subshiny to shiny, very thinly microtomentose, dark brown; scutellum weakly convex (western United States and Canada) *S. marinensis* (Cresson)

***Scatella savegre* Mathis and Zumbado, new species**
(Figs. 1–4)

Description.—Moderately small to medium-sized shore flies, body length 2.20–3.35 mm; generally dark colored.

Head (Figs. 1–2): Mesofrons shiny, dark

brown, mostly bare of microtomentum except for narrow area immediately anterior of anteromedial ocellus and extended to frontal suture; parafrons dark brown, densely microtomentose; fronto-orbits slightly darker than parafrons; ocelli arranged in almost equilateral triangle with distance between posterior pair slightly less than that between either posterior ocellus and anteromedial ocellus. Face bicolored, dorsum of interfoveal hump brown, contrasted with grayer ventral portion. Gena concolorous with ventral portion of face, slightly more than ¼ eye height; gena-to-eye ratio 0.26–0.28.

Thorax: Mesonotum mostly dark brown,

subshiny, thinly microtomentose, becoming lighter brown and more microtomentose laterally; scutellum weakly convex; postpronotum very light tan to gray; notopleuron brown, densely microtomentose; pleural area generally gray, densely microtomentose, except for brown dorsal $\frac{1}{3}$ of anepisternum and faintly brown area at ventral margin of anepisternum. Wing of male (Fig. 3) mostly hyaline, no evident spots except for an apical, narrow, brown linear spot at apex of vein R_{2+3} and R_{4+5} ; wing of female (Fig. 4) generally faintly infusate with white markings as follows: cell r_{2+3} with a linear spot at mid length and subapically; on either side of crossvein rm ; cell r_{4+5} with 2 additional spots apicad of level of crossvein $dm-cu$; 1–2 irregular spots subapically in discal cell, cell M with a basal, C-shaped spot and a faint subapical spot; cell cua_1 with a spot just basad of level of crossvein $dm-cu$; crossvein rm and area immediately surrounding in female more darkly infusate than remainder of wing; costal vein ratio 0.17–0.19; M vein ratio 0.59–0.61. Legs with femora gray, slightly darker posteroapically; hindfemora shiny blackish brown posteriorly; tibiae blackish brown to black; tarsi black.

Abdomen: Dorsum of tergites dark brown, subshiny; basal tergites slightly lighter, especially laterally; ventral portion of tergites becoming gray. Structures of male terminalia not described or illustrated as they are similar to other congeners of the *triseta* group.

Type material.—The holotype male is labeled "COSTA RICA. San José: Río Savegre (9°35'N, 83°48'W; 2,450 m); 29 Jun 2001, W. N. Mathis/USNM ENT 00187058 [plastic bar code label]/HOLOTYPE ♂ *Scatella savegre* W.N.Mathis & M.A. Zumbado [red]." The holotype is double mounted (minuten in a small block of plastic), is in excellent condition, and is deposited in INBio. Paratypes are as follows: bearing the same locality data as the holotype (13 ♂, 6 ♀; INBio, USNM). *COSTA RICA*. San José: Río Savegre, San Gerardo de Dota

(9°39.5'N, 83°51'W; 2,180 m), 29–30 Jun 2001, W. N. Mathis (9 ♂, 8 ♀; INBio, USNM); Río Savegre, Cabinas Quetzal (9°33'N, 83°48'W; 2,270 m), 7–8 Aug 2001, D. and W. N. Mathis (10 ♂, 4 ♀; INBio, USNM); Río Savegre (9°33'N, 83°48.5'W; 2,180 m), 7–8 Aug 2001, D. and W. N. Mathis (2 ♂, 1 ♀; USNM).

Distribution.—Neotropical. Costa Rica (San José).

Natural history.—This species occurs along fast flowing, montane streamlets and rivers where there are sandy to muddy shorelines or where there are pockets of less turbulent water. We also found specimens at the head of a small spring or seepage area that was filled with emergent but low-lying vegetation. All specimens were netted in the mountains of the central cordilleras of Costa Rica at higher elevations between 2,180–2,450 m.

Etymology.—The species epithet, *savegre*, is to recognize the locality and drainage system where this species occurs and is a noun in apposition.

Remarks.—Although this species substantially extends the range of the *triseta* group and is somewhat disjunct from the other included species, collection of additional species in other mountainous regions of Mesoamerica is anticipated.

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LITERATURE CITED

- Clausen, P. J. 1987. A new species of *Pelina* (Diptera: Ephydriidae) from the Neotropical Region. *Entomological News* 98(1): 10–12.

- Coquillett, D. W. 1910. The type-species of the North American genera of Diptera. Proceedings of the United States National Museum 37: 499-647.
- Mathis, W. N. 1986. Studies of Psilopinae (Diptera: Ephydriidae), I: A Revision of the shore fly genus *Placopsidella* Kertész. Smithsonian Contributions to Zoology 430: iv+30 pp.
- Mathis, W. N. and G. E. Shewell. 1978. Studies of Ephydrinae (Diptera: Ephydriidae), I: Revisions of *Parascatella* Cresson and the *triseta* group of *Scatella* Robineau-Desvoidy. Smithsonian Contributions to Zoology 285: iv+44 pp.
- Mathis, W. N. and T. Zatwarnicki. 1990. A revision of the western Palearctic species of *Athyroglossa* (Diptera: Ephydriidae). Transactions of the American Entomological Society 116(1): 103-133.
- . 1995. A world catalog of the shore flies (Diptera: Ephydriidae). Memoirs on Entomology, International, Associated Publishers, Gainesville, Florida, 4: vi+423 pp.
- McAlpine, J. F. 1981. Morphology and terminology-adults, pp. 9-63. In McAlpine, J. F., B. V. Peterson, G. E. Shewell, H. J. Teskey, J. R. Vockeroth, and D. M. Wood, eds. Manual of Nearctic Diptera, Vol. 1, vi+674 pp. Agriculture Canada Monograph 27, Ottawa.
- Wirth, W. W. 1965. Family Ephydriidae, pp. 734-759. In Stone, A., C. W. Sabrosky, W. W. Wirth, R. H. Foote, and J. R. Coulson, eds. A Catalog of the Diptera of America north of Mexico. United States Department of Agriculture, Agriculture Handbook 276: iv+1696 pp.
- . 1968. 77. Family Ephydriidae, pp. 1-43. In Papavero, N., ed. A Catalogue of the Diptera of the Americas South of the United States. Departamento de Zoologia, Secretaria da Agricultura, São Paulo.